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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,301	07/11/2003	Masaki Hamamoto	59559 (70551)	4334
21874	7590	10/07/2005	EXAMINER	
EDWARDS & ANGELL, LLP P.O. BOX 55874 BOSTON, MA 02205			HOLZEN, STEPHEN A	
			ART UNIT	PAPER NUMBER
			3644	
DATE MAILED: 10/07/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/618,301	HAMAMOTO ET AL.	
	Examiner	Art Unit	
	Stephen A. Holzen	3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 31-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30, 36 and 37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/11/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to Hamamoto have been fully considered and are persuasive. The rejection of the claims in view of Hamamoto has been withdrawn because of common inventorship and common assignment.
2. Applicant's arguments with respect to the rejection in view of Kim have been fully considered and are persuasive. The rejection of the claims over Kim has been withdrawn because the wings of Kim are made such that they "lack elasticity" (see Col. 5, lines 21).
3. Applicant's arguments with respect to Michelson have been fully considered but they are not persuasive. The examiner appreciated the opportunity to discuss these claims in view of the Michelson during a telephone interview on 1/5/2005, however the examiner has reconsidered the Michelson reference and applicant's arguments, and believes that the claims are still anticipated (or rendered obvious) in view of the Michelson reference. The applicant is invited to call the examiner and discuss this rejection if desired.
4. The applicant has argued that Michelson reference/apparatus cannot hover as claimed. Michelson does however teach that a hovering capability is an object of his invention (see col. 2, lines 31-33). Secondly, applicant has not specifically claimed a

“hovering” operation. Applicant’s claims are drawn to an apparatus that is driven by a driving unit and controlled by a control unit. “Hovering” is not positively recited. In fact the language only goes so far as to claim “the extent to which” the apparatus hovers or moves. The alternative claim language requires either hovering or moving, not both. The hovering limitation is not specifically claimed in a structural relationship, only a function one. The disclosure of Michealson needs only to have the capability to hover for it to anticipate the reference.

See In re Hutchison 69 USPQ 138

In re Fuller, 1929 O.D. 172; 388 O.D. 278

Ex parte Masnam 2 USPQ 2d 1642 (1987)

MPEP 2114 states “While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than by function.” See In re Schreiber, 128 F 3d 1473 1477-78, 44 USPQ 2d 1429, 1431-32 (Fed. Cir 1997)

5. Applicant has further argued that flexibility is not the same as elasticity. The examiner disagrees. Houghton Mifflin company defines

- a. Flexible: Responsive to change; adaptable....
- b. Elastic: Capable of adapting to change....

Please see the attached and cited references from www.answers.com

These words are synonyms for each other as taught by Houghton Mifflin (as disclosed in the attached reference (www.answers.com)). Lacking any specific definition in the originally filed specification, the examiner asserts that these words have substantially the same scope.

6. Applicant has further argued on page 17 of the reply filed on 1/6/2005 that Michelson nowhere discloses, "...a lifting force without a thrust component can be generated...". Since these limitations have not been claimed, applicant's argument in this regard is moot. Michelson does not however teach a hovering capability (see Col. 2, ^{lines} ~~lines~~ 31-33).

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-30, 36 and 37 are rejected under 35 U.S.C. 112, first paragraph.

Re – Claims 1, 36 and 37: The specification, while being enabling for a pair of wing portions, does not reasonably provide enablement for only one wing portion. The specification does not enable any person skilled in the art to which it pertains, or with

which it is most nearly connected, to use the invention commensurate in scope with these claims without undue experimentation.

10. Claims 1-30, 36 and 37 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01.

Re – Claims 1, 36 and 37: The omitted elements are: a second wing portion.

11. Claims 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The examiner cannot determine what all is meant by and encompassed by the "thickness" limitation of this claim. The examiner could not find a discussion in the specification relating to the thickness of the upper and lower sections of the wings and therefor could not ascertain the scope of this limitation.

12. The term "optimal" in claim 21 is a relative term, which renders the claim indefinite. The term "optimal" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. What all is meant and encompassed by the phrase "optimal"? The examiner cannot determine the scope of this word.

13. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "may be" is indefinite since the examiner cannot determine if this limitation is part of the claim scope or not. The metes and bounds of this claim have not been clearly and positively defined by the applicant.

14. Claim 30 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "of a prescribed portion of said wing" is indefinite since the examiner cannot determine what all is encompassed and meant by this phrase. The metes and bounds of this claim cannot be determined and therefore the claim is indefinite.

Status of Claims

- 15. Claims 1-37 are pending
- 16. Claims 31-35 are withdrawn
- 17. Claims 1-30, 36 and 37 are rejected

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

19. Claims 1-5 and 8-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Michelson (6,082,671).

Re – Claims 1-5, 36 and 37: Michelson disclose an apparatus (10) comprising a body (11) with wings (12) and a driving unit (13), a control unit (inherently illustrated and discussed in Col. 5, lines 65+), and wherein the wings are elastically deformable (i.e. flexible), upper wave plate structures comprising alternating ridge lines and valleys extending along the span direction of the wing (see slots #17), wherein the wings have a leading edge portion (see figure 8c).

The phrase “when driven by said driving unit...hovers or moves in said surrounding fluid” has not been given patentable weight. The examiner asserts that these limitations are functional in nature. While claims may be recited by their function, an apparatus must be differentiated by structure and not by function.

Re – Claims 2 and 3: Michelson discloses a wing portion having an upper and lower side (inherent) wherein the upper side has greater flexural rigidity than that of the lower side (#26, #27 have greater rigidity than the trailing edges).

Re – Claim 8: Michelson inherently discloses flapping wings that do not necessarily have fluid flowing over them at the same velocity.

Re- Claim 9: Michelson discloses a wing portion having a tip and a root and an angle of attack. (See Figures 8a-8c)

Re- Claims 10, 11 and 12: Michelson discloses a wing portion having a first section having a greater flexibility than a second portion (see Figure 8a-8c), wherein the

wing is rotatable about a center of rotation having sections that are of varying thicknesses.

Re – Claim 13: The wing portion having a leading and trailing edge and having a axis of rotation approximately midway between the leading edge and the trailing edges of the wing (see Figure 2a and 7b).

Re – Claim 14: Figure 2D₂ illustrates a control unit and a lower surface. (A large portion of this claim defines the invention functionally instead of structurally, and a claim is only patently differentiated from the prior art in terms of structure and not function).

Re – Claim 15: Figure 2D₂ illustrates that an upper surfaces has a convex curvature while the lower surfaces has a concave curvature. (A large portion of this claim defines the invention functionally instead of structurally, and a claim is only patently differentiated from the prior art in terms of structure and not function).

Re – Claim 16: Discloses a wing portion having a root portion (see Figure 7a-7c). (A large portion of this claim defines the invention functionally instead of structurally, and a claim is only patently differentiated from the prior art in terms of structure and not function).

Re – Claims 17, 18-25: Figure 7 of Michelson discloses a wing with an outer tip and is elastic. (A large portion of claim 17, and all of claims 18-25 defines the invention functionally instead of structurally, and a claim is only patently differentiated from the prior art in terms of structure and not function).

Re – Claim 26-29: The claims attempt to define the ranges in which specific variables may fall. However since the applicant has only claimed these limitations

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functionally, they are not patentably distinguishable from the prior art. The prior art only need to be capable of having these claimed characteristics. Michelson inherently has the capability to be used in an environment where these limitations are anticipated.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 6, 7 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Michelson in view of ordinary skill in the art.

Re – Claim 6: Michelson inherently discloses an upper and lower side of the wings, on each side of the stiffening means (120-127).

Re – Claim 7: Michelson discloses a wing having a front and trailing edges.

Michelson discloses every aspect of the invention except the thicknesses of the upper and lower surfaces. It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the thickness of the upper and lower surfaces since it has been that discovering an optimum value of a variable involves only routine skill in the art. (See *In re Boeson*, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

Re – Claim 30: Michelson discloses a wing having an outer tip portion and a root portion having a “prescribed thickness and stiffness”. Michelson does not disclose that

the stiffness gradually increases from the tip to the root in proportion to a square of the distance from the tip end portion of said wing portion to said prescribed portion.

However this limitation is merely defining the value of stiffness of the wing from the tip to the root. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the wing differentially stiff at the locations from the root to the tip of the wing since it has been held that discovering an optimum value of a variable (i.e. stiffness) involves only routine skill in the art. In re Boeson, 617 F. 2d 272, 205 (USPQ 215, (CCPA 1980))

Notes to Applicant

The examiner understands the differences between the prior art and the instant invention. However the examiner does not believe that the applicant has worded the claims in such a way that would overcome the prior art. The examiner suggests rewording the claims so that they are differentiated from the prior art in terms of structure and not by function. While the examiner did not have enough time to draft claims that would overcome the Michelson reference the examiner believes that if the applicant were to amend claim 1 to recite a structure (instead of what the driving unit does) and incorporates the "thickness" limitations of claim 6, then this claim will be allowable. Alternatively the examiner believes that if the applicant amends claim 2 into claim 1 and positively recites the upper and lower surfaces having different structural characteristics and emphasizes these claimed differences in the remarks section of the reply, this amendment claim would probably be allowable.

Conclusion

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen A. Holzen whose telephone number is 571-272-6903. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sah



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